Amendments to the Claims

This listing of the claims will serve to replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A septic tank monitoring system for distinguishing between and identifying the location of a sedimentary layer, a scum layer, and any intervening liquid zone in a septic tank, the septic tank monitoring system comprising:

an elongate sensing probe with a first end and a second end for being disposed in the septic tank;

a plurality of sensors disposed along the sensing probe, the plurality of sensors each including a means for providing a signal that enables a determination of whether the sensor is disposed proximal to the sedimentary layer, the scum layer, or any intervening liquid zone in the septic tank ~~wherein at least one of the plurality of sensors comprises a temperature transducer~~ wherein a plurality of the sensors comprise temperature transducers comprising thermistors for sensing at least one of the sedimentary layer, the scum layer, and/or any intervening liquid zone and wherein a rate of heat transfer from the thermistors to a surrounding medium is determined to provide an indication of whether the sensor is disposed proximal to the sedimentary layer, the scum layer, or any intervening liquid zone in the septic tank; and

a remote monitor for being operably associated with the plurality of sensors wherein the remote monitor has a means for providing a remote indication to a septic tank operator of the

location of the sedimentary layer, the scum layer, and any intervening liquid zone in the septic tank based on the signals from the plurality of sensors;

whereby the septic tank operator can monitor the contents and condition of the septic tank without a need for excavating and physically inspecting the septic tank.

2. (original) The septic tank monitoring system of claim 1 wherein the elongate sensing probe comprises an elongate member and a retaining member slidably associated with the elongate member and a means for biasing the retaining member to an extended position wherein a distal end of the retaining member comprises the first end of the elongate sensing probe and a distal end of the elongate member comprises the second end of the elongate sensing probe whereby the elongate sensing probe can be inserted into and retained within the septic tank by compressing the retaining member relative to the elongate member, orienting the elongate sensing probe in the septic tank, and allowing the retaining member to decompress relative to the elongate tube whereby elongate sensing probe can be frictionally retained in the septic tank with the first end of the elongate sensing probe frictionally engaging a first boundary of the septic tank and the second end of the elongate sensing probe frictionally engaging a second boundary of the septic tank.

3. (original) The septic tank monitoring system of claim 2 wherein the retaining member comprises at least a length adjustment member and further comprising a means for adjustably coupling the length adjustment member to the elongate sensing probe for adjusting the effective length of the elongate sensing probe.

4. (original) The septic tank monitoring system of claim 3 wherein the retaining member further comprises a body portion that is slidably associated with the elongate member and wherein the length adjustment member is adjustably coupled to the body portion of the retaining member.

5. (original) The septic tank monitoring system of claim 4 wherein the length adjustment member is adjustably coupled to the body portion of the retaining member by a threaded engagement whereby the length adjustment member can be extended and retracted relative to the body portion by operation of the threaded engagement.

6. (original) The septic tank monitoring system of claim 3 wherein the first and second ends of the elongate sensing probe each have at least one point for positively engaging the boundaries of the septic tank.

7. (original) The septic tank monitoring system of claim 6 wherein the first and second ends of the elongate sensing probe are generally conical.

8. (canceled)

9. (canceled)

10. (currently amended) The septic tank monitoring system of claim ~~9~~ 1 wherein ~~a~~ the rate of heat transfer from the thermistors to ~~a~~ the surrounding medium is determined by the formula:

$$\dot{Q} = kA(T - T_0)/\delta$$

where $A = \pi D^2/4$ and is the area of the thermistor and δ is the appropriate boundary-layer thickness, and k is the thermal conductivity of a uniform medium in a vertical adiabatic wall in which the thermistor is mounted.

11. (currently amended) The septic tank monitoring system of claim 10 wherein the time rate of change of thermistor temperature is obtained by the formula:

$$C_T(dT/dt) = P - \dot{Q}$$

where C_T is the heat capacity ~~if~~ of the thermistor.

12. (original) The septic tank monitoring system of claim 1 further comprising a tank electronics unit coupled to the elongate sensing probe wherein each of the plurality of sensors is electrically coupled to the tank electronics unit and wherein the tank electronics unit is operably associated with the remote monitor.

13. (original) The septic tank monitoring system of claim 12 wherein the tank electronics unit is operably associated with the remote monitor by an interconnecting cable for traveling from the septic tank to the remote monitor.

14. (original) The septic tank monitoring system of claim 13 further comprising a cover plate for being disposed over the interconnecting cable as the interconnecting cable exits the septic tank for shielding the interconnecting cable from damage.

15. (original) The septic tank monitoring system of claim 1 further comprising a microcontroller operably associated with each of the plurality of sensors for providing each sensor with a high frequency alternating current flow.

16. (original) The septic tank monitoring system of claim 15 wherein the high frequency alternating current is approximately 10 KHz.

17. (original) The septic tank monitoring system of claim 15 further comprising a multiplexer and a synchronous demodulator for multiplexing and demodulating analog voltage signals produced by the current flow to each sensor and an analog to digital converter for converting the analog voltage signals to digital voltage signals.

18. (original) The septic tank monitoring system of claim 17 further comprising means for processing and analyzing each digital voltage signal to determine for each sensor whether the material disposed in proximity to the sensor is the sedimentary layer, the scum layer, or any liquid zone within the septic tank and means operably associated with the remote monitor for displaying

information representative of whether the material disposed in proximity to each sensor is within the sedimentary layer, the scum layer, or any liquid zone.

19. (currently amended) A system for distinguishing between and identifying the location of stratified layers in a container, the system comprising:

an elongate sensing probe with a first end and a second end for being disposed in the container;

a plurality of sensors disposed along the sensing probe, the plurality of sensors each including a means for providing a signal that enables a determination of whether the sensor is disposed proximal to a given layer of material in the container ~~wherein at least one of the plurality of sensors comprises a temperature transducer~~ <u>wherein a plurality of the sensors comprise temperature transducers comprising thermistors for sensing at least one of the sedimentary layer, the scum layer, and/or any intervening liquid zone and wherein a rate of heat transfer from the thermistors to a surrounding medium is determined to provide an indication of whether the sensor is disposed proximal to the sedimentary layer, the scum layer, or any intervening liquid zone in the septic tank</u>; and

a remote monitor operably associated with the plurality of sensors wherein the remote monitor has a means for providing a remote indication of the location of layers in the container based on the signals from the plurality of sensors;

whereby a condition material in the container can be perceived.

20. (original) The system of claim 19 wherein the elongate sensing probe comprises an elongate member and a retaining member slidably associated with the elongate member and a means for biasing the retaining member to an extended position wherein a distal end of the retaining member comprises the first end of the elongate sensing probe and a distal end of the elongate member comprises the second end of the elongate sensing probe whereby the elongate sensing probe can be inserted into and retained within the container by compressing the retaining member relative to the elongate member, orienting the elongate sensing probe in the container, and allowing the retaining member to decompress relative to the elongate tube whereby elongate sensing probe can be frictionally retained in the container with the first end of the elongate sensing probe frictionally engaging a first boundary of the container and the second end of the elongate sensing probe frictionally engaging a second boundary of the container.

21. (original) The system of claim 20 wherein the retaining member comprises at least a length adjustment member and further comprising a means for adjustably coupling the length adjustment member to the elongate sensing probe for adjusting the effective length of the elongate sensing probe.

22. (canceled)

23. (canceled)

24. (currently amended) The system of claim ~~9~~ 19 wherein ~~a~~ the rate of heat transfer from the thermistors to ~~a~~ the surrounding medium is determined by the formula:

$$\dot{Q} = kA(T - T_0)/\delta$$

where $A = \pi D^2/4$ and is the area of the thermistor and δ is the appropriate boundary-layer thickness, and k is the thermal conductivity of a uniform medium in a vertical adiabatic wall in which the thermistor is mounted.

25. (currently amended) The septic tank monitoring system of claim 24 wherein the time rate of change of thermistor temperature is obtained by the formula:

$$C_T(dT/dt) = P - \dot{Q}$$

where C_T is the heat capacity ~~if~~ of the thermistor.